

instructive talk about reptiles, illustrating it with living specimens. Attendance was about 60.

MAY 13. BROOKLYN BOTANIC GARDEN. A walk to see species and varieties of lilacs was led by Dr. Alfred Gundersen, who reported, "Weather and lilacs perfect. Among those seen in fine condition were Vestale, Lucie Ballet, Rochambeau, Mrs. W. E. Marshall, Waldeck-Rousseau, Paul Thirion, Marshal Foch, and *Syringa chinensis*." Attendance 7.

MAY 13-14. CAMP THENDARA. The joint outing with the New York Section of the Green Mountain Club at their camp on Lake Tiorati in the Harriman Section of Palisades Interstate Park was delightful, and the weather perfect. An annual bird census, made under the guidance of Professor Julius Johnson, listed 61 birds. Leader, Mrs. Laura Woodward Abbott. Attendance 28.

PROCEEDINGS OF THE CLUB

MINUTES OF THE MEETING OF FEBRUARY 16, 1944

The meeting was called to order at 3:30 p.m. by Dr. F. J. Seaver, First Vice-President, at the Brooklyn Botanic Garden. Thirty-six members and guests were present. The minutes of the preceding meeting were accepted as read. Since there was no further business, the meeting was devoted to the scientific program.

Mr. Montague Free of the Brooklyn Botanic Garden spoke on plant propagation. He discussed in detail such topics as seed germination, rooting from cuttings, and grafting. Each of these subjects was illustrated with plants growing in the conservatories of the Brooklyn Garden. Using various shrubs and trees, Mr. Free deftly demonstrated the common types of grafting. He displayed several intergrafts that had previously been made, such as Christmas cactus on the stock of *Pereskiaopsis*. Mr. Free's talk was followed by considerable discussion of the topics that he had interestingly presented.

Dr. Henry K. Svenson of the Brooklyn Botanic Garden gave the next report entitled "Through the Flowering Season at the Brooklyn Botanic Garden." The speaker's abstract follows:

A series of Kodachrome pictures showing progress of the seasons from winter time to the displays of snowdrops, crocus, magnolia, and daffodils in the early spring. Next, about the second week in May, comes the extensive display of flowering cherries and crab-apples (the most popular of all), and in the Local Flora area, the trilliums, violets, and other native plants. By June the rose garden and the irises are in full bloom. Later come the various lilacs and the midsummer plants in the herbaceous beds in the Systematic Section. In the fall the asters and goldenrods of the Local Flora area are especially noteworthy.

These are followed by the exhibits of variously-colored chrysanthemums, both out-of-doors and in the greenhouses.

Informal discussion continued, stimulated by the Epicurean delights generously provided by the Brooklyn Botanic Garden.

Respectfully submitted,

EDWIN B. MATZKE
CORRESPONDING SECRETARY

MINUTES OF THE MEETING OF MARCH 7, 1944

The meeting was called to order at 8:15 p.m. by President Levine in Schermerhorn Hall, Columbia University. Twenty-five members and friends were present.

The minutes of the preceding meeting were approved as read. Five persons were unanimously elected to annual membership, and one resignation was accepted with regret.

The scientific program of the meeting was presented by Dr. M. A. Chrysler of Rutgers University, his subject being "The Evolution in the Fern Genus, *Gleichenia*: a Field and Laboratory Study." The speaker's abstract follows:

The growth habit of the tropical fern genus *Gleichenia* was illustrated. The apparent dichotomy exhibited by the leaf is now regarded as a sympodium.

At least four sub-genera, or probably genera, have been distinguished by external characters. The possibility of distinguishing these groups on the basis of structure of the petiolar bundle was examined. The simplest condition is found in the leaf-trace of certain species of *Sticherus*, e.g. *S. Intermedius*. In this group the bundle in cross section has the form of a "C." *Hicriopteris* shows adaptation to the large size characteristic of the group, but the bundle is still C-formed. In *Dicranopteris* the bundle is laterally compressed so as to be deltoid in form, and is more specialized in details. The species *D. pectinata* has a stipe bundle much like the preceding, but its stem is unique in having a sole-nostele. Finally the Old World *Eugleichenia* has the most highly specialized bundle, showing a nearly circular outline with accumulations of xylem at two regions.

Interesting intermediate forms of bundle occur, probably representing evolutionary stages. The proposed arrangement of genera may be represented in a simple genealogical tree.

After discussion of the paper, the meeting was adjourned at 9.30 p.m.

Respectfully submitted,

HONOR HOLLINGHURST
RECORDING SECRETARY

MINUTES OF THE MEETING OF MARCH 15, 1944

The Torrey Botanical Club met on March 15 in Larkin hall of Fordham University as guests of the Fordham Botany Department. Before the meeting began, tea and refreshments were served by members of the staff.

The meeting was called to order at 4:40 p.m. by President Levine. Forty-five members and friends were present. The minutes of the preceding meeting were approved as read.

The scientific talk was presented by Father Berger, who discussed "Experimental Studies on the Cytology of *Allium*" illustrating his talk with charts and slides. The abstract of the paper follows:

Root tips of *Allium cepa* were treated with the following chemical agents: colchicine, acenaphthene, veratrine, sulfanilamide, chloral hydrate, benzene, oxygen lack and alpha-naphthalene-acetic acid. The cytological effects of these treatments were noted and compared with the well known colchicine effects. The results are summarized in the following chart.

TREATMENT	EFFECT ON MITOSIS IN ALLIUM				
	Delayed div. of SA-region	Diplo- chromosomes	Inhibition of spindle	Polyploid cells	Polyploid mitosis
Colchicine	++	++	+	+	+
Acenaphthene	++	++	++	++	+
Veratrine	+	+	+	+	++
Sulfanilamide	+	+	+	+	+
Chloral hydrate	+ slight	+ long	++	+	+
Benzene	+	+	++	+	+
Oxygen lack	slight	poorly developed	+	+	
Naphthalene-acetic acid	meristem —	—	—	—	—
	reg. of elongt.	tetra- chromosomes	—	+	++

The first seven agents all induced polyploidy and produced the same type of cytological effects in spite of the great difference in their molecular structure. The tentative conclusion was drawn that the chief effects are not specific to the particular chemical agents but are general effects common to all the substances in question and interfering with some metabolic process concerned with the formation of the spindle and the division of the SA-region. Benzene has the added property of rendering the structure of prophase chromosomes exceptionally clear so that half chromatids can readily be seen.

Naphthalene-acetic acid differs from all the other agents used in that it has no effect on the formation of a spindle. It produces polyploid cells by an entirely different process. There is no effect on the meristem but differentiated cells of the cortex undergo a double reproduction of their chromosomes in the resting stage. At metaphase tetrachromosomes are formed and two successive divisions of the SA-regions occur.

After a general discussion of the paper, the meeting was adjourned at 5:50 p.m. to permit the audience to inspect the microscopic mounts showing the cytological effects discussed by Father Berger.

Respectfully submitted,

HONOR M. HOLLINGHURST
RECORDING SECRETARY

MINUTES OF THE MEETING OF APRIL 4, 1944

The meeting was called to order at 8:20 p.m. by President Levine in Room 603 of Schermerhorn Hall, Columbia University. Eighteen members and friends were present. The minutes of the preceding meeting were accepted as read.

Dr. Levine introduced the speaker, Professor George H. Shull, whose subject was "Some Genetical Studies with *Capsella*." Dr. Schull discussed the results of his investigations into the various aspects of the genetics of this genus and suggested some problems still to be solved. The talk was illustrated with lantern slides.

Following discussion of the paper, the meeting adjourned at 9:45 p.m.

Respectfully submitted,

HONOR M. HOLLINGHURST
RECORDING SECRETARY

MINUTES OF THE MEETING OF APRIL 19, 1944

The meeting was called to order at 3:30 p.m. by President Levine in the Members' Room of The New York Botanical Garden. Twenty-five members and guests were present. The minutes of the preceding meeting were accepted as read.

The scientific program consisted of a talk by Mr. Jerome Metzner on "The Morphology, Cytology and Taxonomy of *Volvox*," which was illustrated with lantern slides. The speaker's abstract follows:

Although *Volvox* has been investigated frequently since its discovery by Leeuwenhoek (1719), many gaps in our knowledge of it remain. The phenomenon of inversion discovered by Kuschakewitsch (1922) has been worked out in detail by Pocock (1933, 1938) for certain African species of *Volvox*. Zimmerman (1921) has published the only detailed study of mitosis and meiosis in a species of *Volvox*—*V. aureus*. Fertilization has never been observed in any species of *Volvox* although some workers have presented evidence that it does occur. Other workers have shown that some of the eggs of *Volvox* develop parthenogenetically. It has been shown (Uspenski, 1925) that *V. aureus* and *V. globator* have a high iron nutritional requirement and that these species can be maintained successfully in laboratory cultures if regular additions of iron salts are made to the culture medium.

V. Carteri var. *Hazeni* is a new variety of this species which is closely related to the European species *V. tertius*. Asexual reproduction is accomplished characteristically by the production of eight daughter colonies in which the reproductive cells are differentiated at about the 64-celled stage. In sexual reproduction this species is heterothallic. Female colonies produce 18-20 eggs. Male colonies are dwarf and produce about 50 bundles of spermatozooids. It seems probable that a large number of eggs develop parthenogenetically. About 90% germination was secured in oospore germination experiments. It was possible to secure germination of oospores within 10 days after their release from a female colony.

Germination of the oospere results in the formation of an aplanospore or biflagellate zoospore. Either product undergoes successive divisions to form a young colony which inverts to form a juvenile colony. This gives rise asexually to normal *Volvox* colonies. Mitotic division is of the type generally found among the protista. A resting nucleus of a cell in a developing daughter colony contains a large Feulgen positive endosome, a smaller Feulgen negative plasmosome and a linin reticulum with chromatic granules scattered through it. In prophase the plasmosome disappears and endosomal division results in the formation of two polar endosomal masses which undergo chemical changes while being extruded through the nuclear membrane into the cytoplasm. Intranuclear endosomal masses are Feulgen positive whereas after extrusion they are Feulgen negative. It is suggested that there is a flow of nucleic acids from nucleus to cytoplasm wherein the desoxyribose nucleic acid derived from the endosome becomes converted to cytoplasmic ribonucleic acid. In metaphase the chromosomes are tiny and closely associated and the endosomal masses have almost completely disappeared. The anaphases occur quickly and in telophase aggregation of chromatic material results in the reformation of the endosome; in addition the plasmosome reappears. Mitosis is intranuclear. Cytokinesis is achieved by constriction of the protoplast between the daughter nuclei.

A revision of the section *Merrillosphaera* of the genus *Volvox* is suggested in which the species *V. mononac* Smith is abandoned and *V. Migula* (Shaw) Printz is incorporated within another species. It is also suggested that the section *Campbellosphaera* be abandoned and the form *Campbellosphaera obversa* be named *Volvox Carteri* var. *homothalliscus*.

The interest of the audience was attested by the animated discussion which took place upon the conclusion of Mr. Metzner's presentation. The meeting adjourned at 4:50 p.m.

Respectfully submitted,

EDWIN B. MATZKE
CORRESPONDING SECRETARY

MINUTES OF THE MEETING OF MAY 2, 1944

The meeting, which was held at Hunter College, was called to order at 8:15 p.m. by President Levine. There were 80 members and guests present. The minutes of the preceding meeting were approved as read.

Dr. Matzke was asked to read the following communication from the Committee on the C. Stuart Gager Memorial of the Brooklyn Institute of Arts and Sciences:

Last August, in the death of Dr. C. Stuart Gager, the world lost an eminent scientist, the Brooklyn Botanic Garden a great curator and administrator, and all who love horticulture a staunch and loyal friend.

The Brooklyn Botanic Garden has become a place of great interest largely through his vision and continued efforts, carried on over a period of thirty-three years. Its beauty is a constant source of delight to thousands of visitors each year. The adult classes in gardening, the lectures on horticulture, the instruction given to children, have blazed a new trail in botanic activities and the lives of many people have been broadened and enriched by the program which Dr. Gager conceived, organized and administered.

Dr. Gager's name should always be remembered with appreciation and gratitude. It is fitting that those who knew his work should want to provide a lasting memorial, which would remind the on-coming generation of the debt that all lovers of beauty owe to him.

With this in view, the Trustees of the Brooklyn Institute of Arts and Sciences have authorized a "C. Stuart Gager Memorial Fund" to be raised by voluntary subscriptions. The memorial selected will be determined by the size of the fund available, and will be something truly commemorative of Dr. Gager and of his life work.

It seems clear that many friends of the Garden and admirers of Dr. Gager and his work will wish to contribute to a Fund for this purpose. If you are one of those who believe in such recognition for notable contribution to the community, and wish to help toward that end, please send your check to the Brooklyn Botanic Garden, 1000 Washington Avenue, drawn to the order of the "C. Stuart Gager Memorial Fund."

It will be especially helpful if this may be done promptly.

The scientific program of the meeting was presented by Mr. Rutherford Platt. The subject of Mr. Platt's talk was "The Mechanics of Spring." The speaker's abstract follows:

"The Mechanics of Spring" touched the high spots of events from the flowing of maple sap to the visits of insects to flowers. The Kodachromes showed details taken through a magnifying lens.

Mr. Platt's viewpoint was that of the mechanics of plant life. In his introduction he remarked that the landscape never stands still. In a broad categorical sense, the most conspicuous mechanical operation in spring is that of opening buds. In summer it is the way flowers behave when insects visit them; in fall and winter it is the opening of seed cases and ejection and dissemination of seeds.

Pictures showed examples of phyllotaxy: conduplicate, plicate, circinate, convolute, involute. Then followed the operation of bud scales and the various ways the contents emerge. Particularly vivid were the pictures of hardwood flowers. Those of elm and oak showed pollen ejected. The talk closed with illustrations of what happens when butterflies and bees visit various wild flowers. Although not using movies, Mr. Platt showed pictures in sequence using stills with lapsed time.

At the conclusion of Mr. Platt's most interesting talk, President Levine announced that the meeting would be adjourned so that the Club would have an opportunity to talk informally with Mr. Platt and to visit the laboratories and greenhouse of the Biology Department of Hunter College. Tea and refreshments were served by members of the College faculty.

Respectfully submitted,

HONOR M. HOLLINGHURST
RECORDING SECRETARY